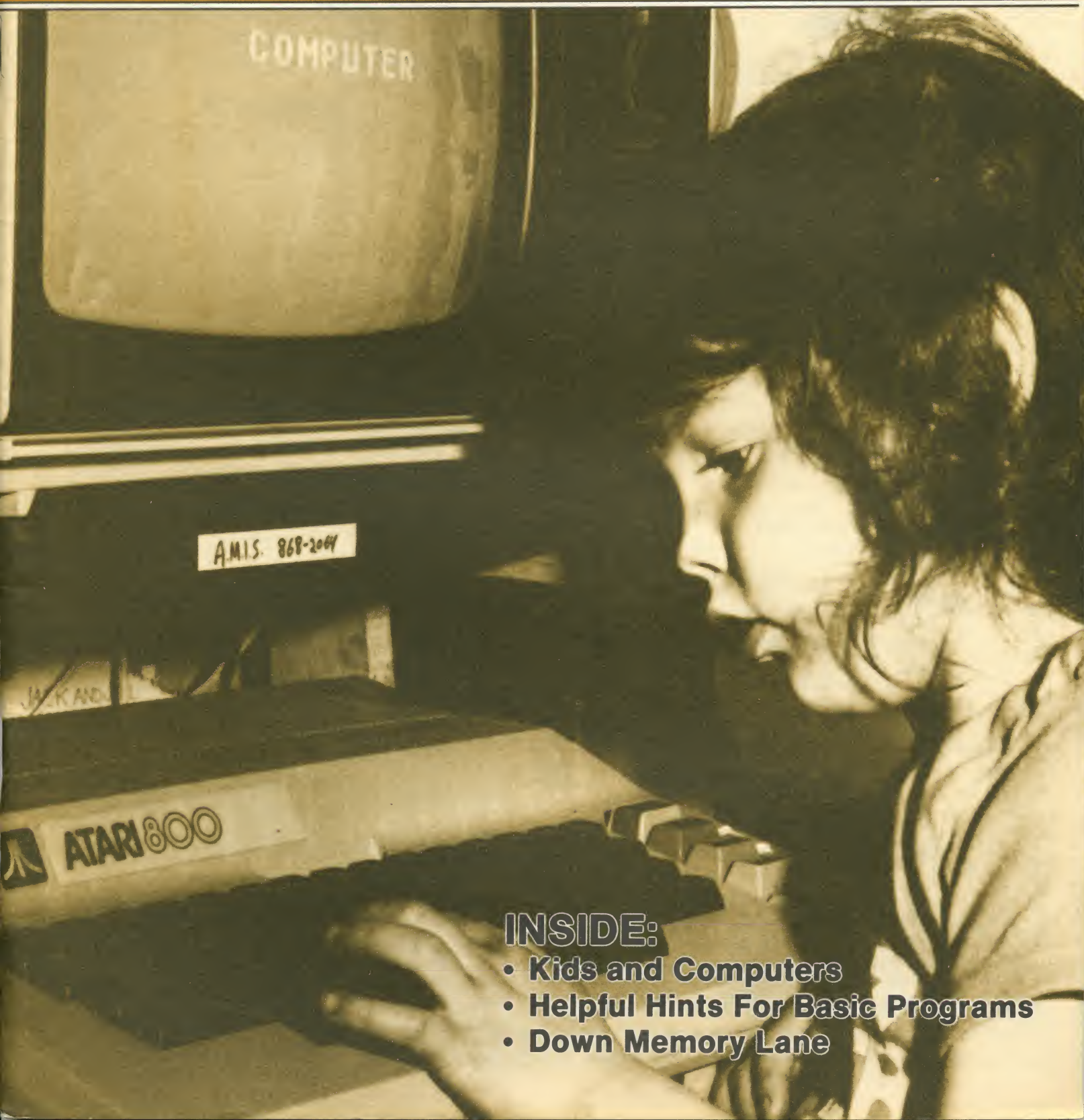


May, 1982
NEWSLETTER

\$2⁰⁰
Vol. 2, No. 5

MICHIGAN ATARI COMPUTER ENTHUSIASTS



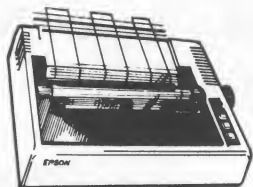
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- Kids and Computers
- Helpful Hints For Basic Programs
- Down Memory Lane

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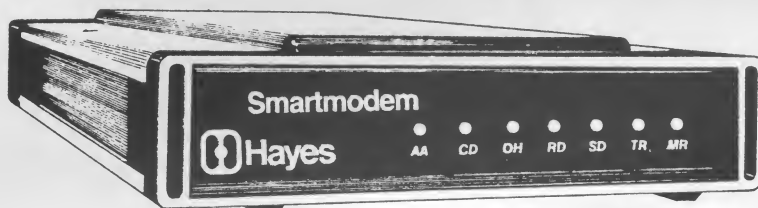
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APRIL MEETING MINUTES

Sheldon Leemon, Secretary

By now I'm getting pretty tired of starting these things with membership boasts, so suffice it to say that we passed the 400 mark last month.

For Show-and-Tell, Craig Chamberlain led off with a demonstration of the Advanced Music Composer from APX, which allows for fast tempos (tempii?) and in addition lets you play a lot of notes in a short time. It allows for envelope shaping (something like twisting balloons into animal shapes) by the expedient of turning long notes into a lot of shorter notes of differing volume. That can mean a lot of notes to enter, but also some nice sounding music.

A short unplanned demo of some new games (Apple Panic, Threshold) came next. In the future, we plan to dispense with all unplanned presentations. At least, that's the plan. The business portion of the meeting followed, where the most important piece of business introduced was the authorization of the board to investigate a projection TV system to alleviate present monitor woes. Hopefully, an demo of an outrageously expensive system will be one of the feature of the May Birthday Party.

Following the business portion, I gave a short summary of my findings on the new Microsoft BASIC, and took some questions. I must admit, being used to Atari BASIC, I am somewhat slow to warming up to this big mother. But, as pointed out by Tom Giese, it has several very powerful features, such as the defined function command, that bear closer examination. It also has at least a few bugs (one member claims that under certain circumstances, the time stack shows up in the screen display area!!).

Finally, Craig Chamberlain did an encore with an introduction to Atari PILOT. Unfortunately, because of the late hour, many members missed his presentation. In the future, we will try to present the main program first, so that those wishing to take advantage of the late store hours on MACE

nights may do so without missing the program. Either that, or we will dispense with the program altogether and organize into gangs for the purpose of looting the stores. It would serve them right for turning what would otherwise be a religious experience into a crass opportunity to gather in the green.

One piece of business that came up at the board meeting that the membership at large might wish to be aware of is the possibility of starting MACE chapters in other cities. Under this plan, the otherwise-autonomous club would be offered the main benefits of MACE membership (i.e. the incomparable MACE newsletter, and program library), at a reduced group rate which would allow the club to collect its own dues in addition. By shipping the newsletters in one batch by UPS, MACE would save enough money on mailing costs to make this reduced rate economically feasible. We have already had inquiries from groups in Grand Rapids and Lansing, and would entertain bids for chapterhood from any group of 25 or more.

Thanks to Jerry Aamodt for filling in for the absent Arlan, and to Craig for his speechifying. I'm going to cut it short this month, because I've got to get my party shoes on---you all better take notes at the next meeting, because you'll be on your own. Ⓜ

THRESHOLD

Reviewed by
Eric Chodun

Your ship is shooting against many waves of aliens! Lookout! Don't over heat your lasers. Every four boards cleared you say hi to Ma and refuel. Every alien wave gets harrier. Your Ma, or Mother ship refuels your ship and gives you bonus points for each bit of fuel you have left.

Threshold is a hard, fun action game because there are different objects to shoot at for each board (or wave). There are eagles, caterpillars, centipedes, and the like. It's well worth the money! By On-Line Systems.

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*white **white/green ***white/green/brown

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KIDS AND COMPUTERS

By Marshall S. Dubin

After having my computer for a couple of years, and after having learned to program in BASIC, a smattering of ASSEMBLER, and PILOT, and after having learned my fair share of "computereese", I considered myself to be finally computer literate. Big deal! The other day when I came home from work, there was my wife and three year old daughter Samantha seated at the Atari, and the three year old was trying to teach my wife the sequence for clearing the screen. In fact, so my chagrined wife reported to me later that evening, Samantha had taught her not only how to turn on the machine, but how to boot the disk drive up before powering on the computer!

Alright, so maybe Dianne had been working for a couple of weeks with Samantha on the computer, and maybe Samantha was strutting her stuff by showing mommie how its done, BUT, my definition of computer literacy, having evolved as a result of my own trials and tribulations within the shadowy world of bits and bytes, suddenly became shatteringly inadequate. For example, I always hesitated to consider my three thousand dollar investment in high technology a "game machine", and I never did consider present offerings of software to have any REAL educational value, and yes, I scoffed at the value of playing shoot-em up video games. You can't learn from turning on the power and playing with the keys! About then I woke up.

Learning, is said to be a change in behavior as the result of some intervention. Normally we think of parents and teachers as the ones providing that intervention, and usually this is the case. Often overlooked, however is the environment and its influences upon the learning process. This is the educational "ecology", and becoming more and more prominent within this sphere is the microcomputer.

At the more advanced levels of learning, computers can do wonderful things. They can provide instruction, drill and practice, present information and test for knowledge and skills. These types of tasks are becoming more and

more integrated with computers all the time. School districts are buying computers left and right. Entire curriculums are cropping up right before our very eyes, technologists are telling us how to build computers, educators tell us how to use them, philosophers are deciding whether we should use them, and futurists drool with delight and anticipation over what is yet to come. With this great march of technology comes the development of highly integrated, structured educational experiences designed around the use of a micro...but wait. I was telling you about Samantha, wasn't I?

At three, she had not the opportunity to part take of all the structured learning experiences awaiting her in school. She cannot read or write to any degree of sophistication, let alone manipulate the Atari joystick in many of the fancy maneuvers required by much of the pre-school software I brought home to her. She obviously has no formal training in computers. So why the learning? And why the sudden interest of my wife Dianne (when are you going to resign from that stupid computer club) Dubin?

It started out by letting her play around in the "memo pad" mode. This basic exercise of printing letters on the TV mushroomed in no time at all...like so:

..."can I spell my name?"
..."how do you erase it?"
..."how do the letters get so big?"
..."can I put the disk in"
..."no mommy, this is the disk with my stuff"
..."daddy, can I press buttons?"
..."daddy, when you're done with your homework, can I be next?"
..."mommy, can I use daddys 'umputer?"
..."daddy, first you got to boot up the disk"

...Hmmm.

Naturally, software support at the pre-school level would be great. To date the best attempt at this has been "My First Alphabet", and it's comforting to see that much more is becoming available all the time. Another useful tool is the Votrax speech synthesizer. Your non-reading pre-schoolers will appreciate hearing what they cannot read, not to mention the obvious merits of auditory feedback. But other than that, I can't really recommend much in the way of pre-school

continued

software. Many of the programs I've seen tend to be either too sophisticated for younger children or else too mundane. Graphics and sound are nice, but I can get that result from letting Sam play with Space Invaders. Too much reliance on joystick control is also a problem. Remember that we are dealing at the pre-school level. These kids are just developing their motor and perceptual skills. Coordination is very much a problem as is eye hand movement and span of concentration. To manipulate a joystick even in only two directions, is not especially easy at that age. The tight play of Atari joysticks are pure labor to one so young (and indeed to one so old!). Remember your audience. What's helpful is lots of cause and effect. Bells and whistles that the child can produce with the least amount of coordination. As the child progresses, you can build on this by requiring increasingly more coordinated input. Likewise you can start off with simple cause and effect type activity and build into this basic discriminations of letters, color, objects, words- the sky is the limit. Just start at a level appropriate for the child and DON'T PUSH! Discovery and experimentation are healthy.

Recognize that the lack of outstanding pre-school software does not really handicap you to any great extent. Actually just the experience of using a computer is educational in itself. This so-called learning by doing has many advantages. First of all there is merit in such "discovery learning" in that the child is exposed at his or her own pace to the new experience that a computer provides. Curiosity is at its highest at a young age, and exploration and experimentation greatly stimulate learning. As the child gains experience and familiarity, learning is stimulated even more. As the child grows older, the technology grows with him. Simple cause and effect responses give way to concept acquisition, problem solving ability, and more complex types of learning. For the elementary age child, learning to program offers the benefit of structured logical thinking and problem solving, and the use of a technology which the child has grown to understand and accept. But it has to begin somewhere, and that somewhere usually begins with learning how to "press buttons".

The most simple exercise available is to

let the child play around in the MEMOPAD mode. Let them press the buttons, learn the letters, and get used to sitting at the console. You may want to write a short BASIC routine that echos characters in GRAPHICS 2 size letters, or in inverse video. These stand out and are more easily perceived by young eyes. Playing with games, sound or graphics demos can also be useful, but remember that the key is INTERACTION between your child and the technology. Learning by doing-so to speak.

One of the most popular programs I've used with young children is from our MACE library. It is a spelling program that flashes a word briefly on the screen and the student then responds by spelling the word out on the keyboard. I modified this to do the following:

1. Take a word from a list.
2. Put it on the screen in LARGE print.
3. Allow the child to copy the word by entering characters which will appear underneath the word on the screen.
4. Screen out all non wanted user input.
5. Have the Votrax speak the word as it is put up, and echo the letter responses of the child.
6. Make the word list familiar to the child.

Such a program does wonders for letter and word recognition. It can be practiced at a very early age, requires little sophisticated software (the Votrax is optional, although highly recommended), and can be done at home, literally in your spare time, having measureable results on your child's ability to acquire these vital skills.

But as far as educational and technical sophistication, the program is simplicity in itself. A copy of this program is listed here in this month's MACE. You should try it!

Talking the other day with Mark Davids of the educational SIG, we were toying with the idea of coming up with a compendium of educational Atari software, which may be used as is or customized for individual learning levels. I also understand that some of our members have been doing some neat things with kids and Atari's. I think that many of us

continued

have a lot to share and hopefully we can eventually coordinate some effort to provide a few good educational programs or ideas to members wishing to use their computer as an educational tool. If you're interested, let me know. I would enjoy hearing what others are up to, and by sharing, we ALL learn. Possibly we could even have an educational forum right here in the ol MACE. (I have connections with the editor).

And what of Dianne? Well, since Samantha is so hot and heavy into computers, WHO beats me to the latest copy of the APX catalog? And WHO recommended we run an unclassified ad looking for used Atari 400's??

Computer literacy you say? Remember, the next time your 10 year old blasts the invaders from outer space, its only a matter of time before you start hearing things like..."dad, whats a modem?" or "mommy, how do I allocate RAM for a new OS driver..." Don't say I didn't warn you. ☺



ERROR... ERROR... ERROR.

BAKER STREET BYTES

March Issue!(word processor)
change the last paragraph from:
LINE+1330 to LINE=1340
GOTO 1100 GOTO 1100

APRIL Issue!(variables)

Add the following line to the printer listing:
32535 ?"TYPE Y FOR YES"

This listing should have also appeared:

```
32500 REM VARIABLE NAME LISTER
32510 REM BY RICHARD GIZYNSKI
32560 WHERE=PEEK(130)+256*PEEK(131)
32580 IF WHERE=PEEK(132)+256*PEEK(133)
THEN PRINT "--THAT'S ALL FOLKS":END
32590 PRINT CHR$(PEEK(WHERE));
32600 IF PEEK(WHERE)>127 THEN PRINT " ";
32630 WHERE=WHERE+1
32640 GOTO 32580
```

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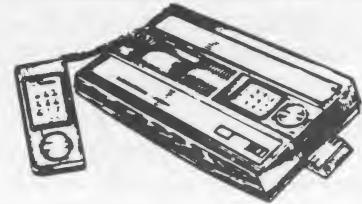
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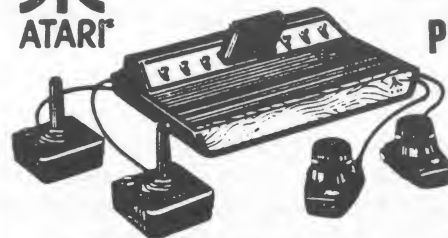
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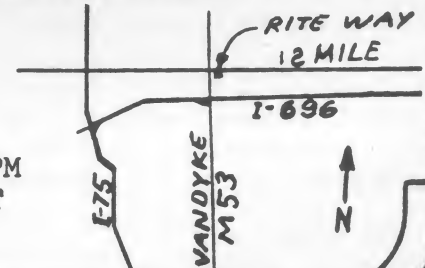
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PRE-SCHOOL LETTER PRACTICE

By Marshall Dubin

This program is designed to teach letter and word recognition primarily in pre-school children. The listing shown here was designed for use with a Votrax speech synthesizer or similar voice output devices, although this is not a requirement.

The screen will display a word from a list of words and pronounce the word as it is displayed. Then the child copies the word using the keyboard. As the letters of the word are entered, the Votrax will echo them back to the child. When the letters have been entered, the child pushes the RETURN key and the word is corrected. If the word was copied correctly, the computer will respond with a RIGHT! If not, the computer will inform the child of the error and allow another chance. If the child misses the second try, the answer is provided and the computer continues with the next word. When all of the words in the list have been used, the computer will display a score.

Although the listing is quite ample, this is really a "bare bones" program. The addition of graphics and sound would spiff it up considerably. Although the program is pretty well documented, here are a few pointers:

1. The variable MAX is set to the number of words in the list. If you use a large list, then set MAX to a tolerable amount of words so the child can see the score routine before he grows up to be an adult.

2. If you don't have a Votrax or some other similar voice output device, fear not -just RUN the program in listing #2 called "NULL". It will create a NULL handler (N:) which will prevent errors when you try to write to a non-existent device (like the little voice that wasn't there). Just LOAD the program NULL and it will create the "N:" device and then it will run the spelling program for you.

3. Make the word list familiar to the child, and age appropriate-although you just MAY be surprised.

4. Just don't turn the child loose on the

program -work with him or her. Provide reinforcement and coaching where necessary. At first you may have to offer a lot of support but soon, the child should master the program well enough to go it alone.

5. If you are serious (and lazy), send me a disk, and I will save you lots of typing time! I think it will work on tape also, but I have not tried it.

6. Let me know your reactions if you do try it. I am open to suggestions and I am willing to offer some myself should you need them.

```
10 REM SPELLING AND LETTER PRACTICE
20 REM FOR PRE-SCHOOL AND UP
30 REM USED WITH VOTRAX TYPE N TALK
40 REM BUT CAN BE MODIFIED BY USING
50 REM THE NULL HANDLER ROUTINE.
60 REM SUPPLIED IN LISTING #2
70 REM
80 REM TO USE WITH TYPE N TALK AND
90 REM A DISK, YOU *MUST* USE AN RS-232
100 REM RELOCATOR AUTORUN.SYS FILE
    ON DISK.(supplied with DOS II)
```

```
110 MAX=23:REM MAX WORDS IN LIST
120 GOSUB 1590:GOSUB 1380:REM
    INITIALIZATION
130 COUNT=0:RIGHT=0:TOT=0
140 RESTORE
150 REM
160 REM COUNT THE WORDS IN THE LIST
170 REM
180 FOR I=1 TO MAX
190 READ A$
200 IF A$="END" THEN 230
210 COUNT=COUNT+1:NEXT I
220 FOR I=1 TO 30:INDEX(I)=0:NEXT I
230 GUESS=0:A$="":B$=""
240 GOSUB 1870
250 REM
260 REM SELECT RANDOM WORD
270 REM
280 IF TOT=MAX THEN 1020:REM DONE
290 WORD=INT(COUNT*RND(1)+1)
300 IF INDEX(WORD)=1 THEN 280:REM WORD
    ALREADY USED
310 INDEX(WORD)=1
320 RESTORE :FOR I=1 TO WORD:READ
    A$:NEXT I
330 REM
340 REM POSITION CENTERING
350 REM
```

continued

```

360 PY=10-INT(LEN(A$)/2+0.5);YP=PY
370 L=LEN(A$)
380 POSITION PY,7;FOR I=1 TO L:PRINT
#6;"-";NEXT I
390 POSITION PY,5
400 REM
410 REM PRINT A WORD
420 REM
430 PRINT #6;A$
440 PRINT #2;A$;CR$
450 TOT=TOT+1
460 BL=LEN(B$)
470 POKE 764,255;GET #1,B
480 REM
490 REM SCREEN OUT NON DESIRED INPUT
500 REM
510 IF B=155 THEN 700;REM RETURN
520 IF B=32 THEN 460;REM SPACE
530 IF B=126 AND BL=1 THEN
B$="";PY=PY-1;POSITION PY,7;PRINT
#6;"-";GOTO 460;REM BACKSPACE
540 IF B=126 THEN
B$=B$(1,BL-1);PY=PY-1;POSITION
PY,7;PRINT #6;"-";GOTO 460
550 IF B>96 AND B<123 THEN B=B-32;GOTO
620;REM CAPS ONLY
560 IF B<65 THEN B=B+64;REM CONTROL
570 IF B>127 THEN B=B-128;REM INVERSE
580 IF B<65 OR B>90 THEN 460
590 REM
600 REM OUTPUT TO SCREEN AND VOTRAX
610 REM
620 PRINT #2;CHR$(B);CR$
630 POSITION PY,7;PRINT #6;CHR$(B)
640 B$(LEN(B$)+1)=CHR$(B)
650 PY=PY+1
660 GOTO 460
670 IF PY<YP THEN PY=YP
680 REM
690 REM CHECK FOR ERRORS...
700 REM YOU CAN BRANCH TO AN OPTIONAL
710 REM SOUND OR GRAPHICS ROUTINE
720 REM FROM HERE TO PERK UP THE
730 REM SCORING PROCESS IF DESIRED
740 REM
750 IF B$<>A$ THEN 880
760 REM
770 REM RIGHT ANSWER
780 REM
790 POSITION 0,5;FOR I=1 TO 25;PRINT #6;"
";NEXT I
800 POSITION 0,7;FOR I=1 TO 25;PRINT #6;"
";NEXT I
810 POSITION 6,5
820 PRINT #6;"RIGHT!"
830 PRINT #2;"RIGHT";CR$

```

```

840 RIGHT=RIGHT+1;PS=200;GOSUB
1820;GOTO 230
850 REM
860 REM WRONG ANSWER
870 REM
880 IF GUESS=1 THEN 950
890 POSITION 3,5
900 PRINT #6;"NO, TRY AGAIN"
910 PRINT #2;"NO TRY AGAIN";CR$
920 GUESS=1;PS=200;GOSUB 1820
930 GOSUB 1870
940 POSITION YP,5;PY=YP;B$="";GOTO 380
950 POSITION 7,3;PRINT #6;"WRONG,"
960 POSITION 4,4;PRINT #6;"THE
RIGHT";POSITION 5,5;PRINT #6;"ANSWER IS"
970 POSITION YP,7;PRINT #6;A$
980 PRINT #2;"WRONG THE RIGHT ANSWER
IS ";A$;CR$
990 PS=400;GOSUB 1820
1000 GOTO 230
1010 REM
1020 REM SCORE ROUTINE
1030 REM
1040 GOSUB 1880
1050 POSITION 1,2;PRINT #6;"HERE'S YOUR
SCORE"
1060 PRINT #2;"HERE IS YOUR SCORE
";NAME$;CR$
1070 PY=10-INT(LEN(NAME$)/2+0.5);YP=PY
1080 POSITION PY,4;PRINT #6;NAME$
1090 POSITION 1,8;PRINT #6;"YOU GOT:
";RIGHT;" WORDS"
1100 POSITION 1,10;PRINT #6;"OUT OF:
";MAX;" TRIES!"
1110 POSITION 1,14
1120 REM
1130 REM CHECK PERCENTAGES
1140 REM
1150 IF RIGHT=MAX THEN 1220;REM 100%
1160 IF RIGHT>INT(MAX*0.8) THEN 1240;REM
80%
1170 IF RIGHT>INT(MAX*0.7) THEN 1260;REM
70%
1180 REM BELOW 70%
1190 PRINT #6;"LET'S PRACTICE"
1200 PRINT #6;" SOME MORE"
1210 PRINT #2;" LET'S PRACK TISS SOME
MORE";CR$;GOTO 1280
1220 PRINT #6;"A PERFECT SCORE!!"
1230 PRINT #2;" A P E R F E C T
SCORE";CR$;GOTO 1280
1240 PRINT #6;"VERY GOOD"
1250 PRINT #2;" VERY GOOD";CR$;GOTO
1280
1260 PRINT #6;"NOT TOO BAD"
1270 PRINT #2;" NOT TOO BAD";CR$

```

continued

```

1280 POSITION 1,20:PRINT #6;"PRESS ANY
KEY TO"
1290 POSITION 4,21:PRINT #6;"PLAY AGAIN"
1300 PS=300:GOSUB 1820
1310 PRINT #2;"PRESS EN NEE KEY";CR$
1320 PRINT #2;"TO PLAY AGAIN";CR$
1330 POKE 764,255:GET #1,A
1340 GOSUB 1870:GOTO 130
1350 REM
1360 REM SET UP DISPLAY
1370 REM
1380 GOSUB 1880
1390 POSITION 0,3:PRINT #6;"SPELLING
AND LETTERS"
1400 PRINT #2;"SPELL LING AND LET
TERS";CR$
1410 PS=300:GOSUB 1820
1420 POSITION 1,10:PRINT #6;"WHAT IS
YOUR NAME"
1430 PRINT #2;"WHAT IS YOUR NAME";CR$
1440 POSITION 2,14:PRINT
#6;"-----"
1450 POSITION 1,14
1460 GET #1,B:IF B=155 THEN 1510
1470 PRINT #2;CHR$(B);CR$
1480 PRINT #6;CHR$(B);
1490 NAME$(LEN(NAME$)+1)=CHR$(B)
1500 GOTO 1460
1510 POSITION 1,17
1520 ? #6;"GET READY"
1530 ? #2;"GET READY ";NAME$;CR$
1540 PS=100:GOSUB 1820
1550 RETURN
1560 REM
1570 REM INITIALIZATION ROUTINES
1580 REM
1590 OPEN #1,4,0,"K:"
1600 POKE 580,1:REM INIT COLD START
1610 DIM A$(20),B$(20),NAME$(20),
INDEX(30),CR$(3)
1620 CR$=CHR$(155)
1630 REM
1640 REM OPEN RS-232 FOR VOTRAX
1650 REM
1660 TRAP 1760
1670 OPEN #2,8,0,"R2:";REM BLOCK MODE
1680 XIO 32,#2,0,0,"R2:";REM FORCE SHORT
BLOCK
1690 XIO 34,#2,48,0,"R2:";REM RTS=ON
1700 XIO 36,#2,13,0,"R2:";REM 4800 BAUD
1710 PRINT #2;CR$
1720 RETURN
1730 REM
1740 REM RS-232 ERROR TRAP
1750 REM
1760 TRAP 40000:TRAP 1770:OPEN

```

```

#2,8,0,"N:";RETURN
1770 TRAP 40000:GRAPHICS 0:PRINT :PRINT
"RS-232 MUST BE BOOTED FIRST!"
1780 CLOSE #2:END
1790 REM
1800 REM PAUSE ROUTINE
1810 REM
1820 FOR I=1 TO PS:NEXT I:RETURN
1830 REM
1840 REM SELECT GRAPHICS MODE
1850 REM AND DISABLE BREAK
1860 REM
1870 GRAPHICS 18:GOTO 1890
1880 GRAPHICS 17
1890 POKE 16,64:POKE 53774,64:RETURN
1900 REM
1910 REM *** WORD LIST ***
1920 REM MAKE SURE THAT MAX IN LINE
1930 REM 120 IS SET EQUAL TO THE
1940 REM NUMBER OF WORDS HERE
1950 REM
1960 DATA CAT,DOG,HAT,BALL
1970 DATA MOMMY,DADDY,TREE,BIRD
1980 DATA FISH,CUP,BED,PIG
1990 DATA HAND,FOOT,TOY,CRAYON
2000 DATA PENNY,BOOK,HOUSE,CAR
2010 DATA BOAT,GRANDMA,GRANDPA
2020 DATA END

```

LISTING #2

```

10 REM NULL HANDLER ROUTINE
20 REM
30 REM This routine must be used
40 REM with the spelling program
50 REM if no voice output device
60 REM is available. Otherwise an
70 REM error condition will occur.
80 REM
90 REM To use, just RUN this program
100 REM first. It will automatically
110 REM create a NULL handler (N:)to
120 REM replace the missing device,
130 REM then RUN the program.
140 REM
150 FOR I=0 TO 53:READ A
160 POKE 1536+I,A:NEXT I
170 TRAP 180:X=USR(1536)
180 TRAP 40000:RUN "D:SPELLING"
190 DATA 160,0,185,26,3,201,0,240,9,
200,200,200,192,34,208,242,56,
96,169,78
200 DATA 169,78 153,26,3,200,169,
36,153,26,3,200,169,6,153,26,3,96,
50,6,50,6
210 DATA 52,6,50,6,50,6,52,6,76,51,6,
160,1,96

```


LEEMON AT LARGE

By Sheldon Leemon

Now, just because of the title of this column, don't think that this is just going to be a carbon copy of the Benioff at Large column in the ACE newsletter. I mean, Mark's writing is so awesome that nobody could duplicate it (although Brian Dunn comes close). But in my own way, I would like to write a more chatty column about your favorite subject and mine. That way, instead of talking about all of that technical stuff that nobody understands anyway, I can get to perpetuate my favorite rumors, and drop a few names in the process.

Like what about that Jerry White? He's one of the most prolific software artists in Ataridom. I mean, he's written "Name that Song" for Quality Software, "Bowling" for PDI, Tricky Tutorial #6 for Santa Cruz Software, "Fileit 2" a home management database for Swifty, "Sunday Golf" for Adventure International, "Player Piano" and "Bowlers Database" for APX and Santa Cruz, "Letter Writer" and "Leap Frog" for C.E., a buncha stuff for Dynacomp, and who knows what else. Didn't you read his articles in Analog, Compute, etc? Well, I was talking to Jerry just the other day. I said "Jerry, what's new in Ataridom?", and he said "Sheldon, I'm glad you asked that question". Him and me talk like this all of the time, you understand. "First of all, have you seen Trivia Trek?" he said. "Trivia Trek, the Movie?" I inquired. "No, Trivia Trek, the Game!" came the response. "I'll ship you one right away".

Now, I must admit that this news did not make my heart beat any faster. Sure, I've been known to turn a page or two of the Book of Lists when conveniently placed in a bathroom, but outside of a desperate hunger to appear on Jeopardy, I've never been what is referred to as a trivia buff. But I was pleasantly surprised when the package arrived. First of all, the trivia quiz is in a nicely done format. Second, the quiz itself is much more interesting than the usual--it even challenged the Ol' Perfesser at times. And Jerry's put a lot of data on the disk, hundreds of questions. Nicest of all, in my opinion, is the accessory program for creating your own

quiz questions. That is where the program really has the potential to take off. Users can easily create their own quiz questions, and there's even a contest sponsored by Swifty Software (the Publisher) for user-created data files. Now fanatics of all stripes can really get their jollies. I mean, baseball buffs can make up data disks full of the most obscure and meaningless statistics, and subject their family and friends to hours of harrassment. The mind boggles. And for the near-normal, it is interesting to note that the program can be used to create academic-type quizzes, for those resolute souls who just have to justify their purchase by actually using it as an educational tool. While not as indispensable as Instedit (the graphics tool for young and old), and rather difficult to use on the commode, this Trivia Trek is really quite a bit better than it has any right to be.

While I'm dropping names, what better one to drop than that of our prez, Arlan? Arlan is at this moment deep in the heart of Texas, on a whirlwind MACE goodwill tour. He will be communing with fellow enthusiasts for a while, and may be bringing back some surprises (like new drives from David Small of Outpost Atari fame). If Arlan's Pokes column doesn't appear, it's because I was supposed to deliver the copy, but lost the key to his house. Remember, you read it here first.

Now for some practical advice. when my printer output started fading some time back, I made a laughable error that must be repeated frequently by the terminally naive. I bought a new ribbon and **THREW THE OLD ONE AWAY!** Such needless waste could have been easily avoided if only I had such a wise counsellor as you do, dear reader. For as the enlightened know, there are many cheaper alternatives. For the really frugal, the ink can be revived by the use of WD-40 or other penetrating lubricant on the ribbon. For the more practical, machines to reink ribbons can be purchased for little more than a new ribbon. SAS Electronics advertised some time back in the Computer Trader that they sell a motorized Mark II inker for \$29.95 with a guarantee of satisfaction, and an Epson Inker for only \$9.95. For further information write them at 3091 N. Bay Dr., North Bend, OR 97459, or call at (503) 756-7155. For those who have used ribbons till the fabric wore out, don't despair. You can still buy refills for

continued

use with the old cartridge. Creative Computer at 1236 East Colonial Drive, Orlando, FL 32803 (305-8944744) advertises cheap reloads (3 Epsos for \$17), and BCCOMPCO 800 South 17, Box 426, Summersville MO 65571 (417 932-4196) even offers to install the reloads if you send them a cartridge. Somewhat more locally, Pete Skeberdis, Box 27, Fremont, MI 49412 offers to sell refills, reload, or even buy the used cartridge from you. So you see, you needn't suffer the embarrassment of having thrown that valuable empty ribbon cartridge away. Another service of MACE, people for computers.

A veritable explosion of new arcade software for the Atari makes a permanent software guide a likely part of future MACE

newsletters. For example, bug shoot-em-ups are now more numerous than legs on a Centipede. Recent entries are Millipedes (nicely done, but has a fatal flaw--the granddaddy of all flickers, which can drive you crazy in an instant) and Megalegs (nicely done, fast, but just a little crude). Although I haven't seen Bug Attack yet, if its like the Apple version it will be no big deal. My conclusion? Wait for the Atari version. It will be released soon, and beats these doggies all hollow.

Do you have any strong feelings about your software? Please send your comments to MACE REPORTS, P.O. Box 2785, Southfield MI, 48037, if you have a piece of software you think is a jewel, or a lemon. (M)

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HELPFUL HINTS FOR BASIC PROGRAMS

by David Bowen

There are three methods of keyboard input for BASIC programs. These methods are (1) INPUT statement, (2) GET statement and (3) PEEK(764). Together these provide a broad range of methods. Each is described below, with an example to illustrate its particular strengths. The differences between the methods occur in the following areas:

- A. Is there any preparation required?
- B. Does the computer stop while waiting for input?
- C. Is there a question mark prompt and cursor displayed?
- D. Does the computer respond to a keystroke with the "chirp" and/or symbol display?
- E. Does the user need to press RETURN to end the input operation?
- F. Does the programmer need to decode the resulting data?

With the above as an introduction, we now turn to describing the three methods.

1. INPUT statement. With this method, the program stops operation when the INPUT statement is reached (i.e. no more BASIC statements are executed until the input operation is finished).

The question mark prompt and cursor are displayed. There is a "chirp" for each keystroke, and the key symbol is displayed. RETURN must be pressed to input the data and have program execution continue. If you are writing a program for people not familiar with computers, this last requirement can be a problem, so include "PUSH RETURN" in the instructions you print. Three large advantages to the INPUT method are: (a) no decoding is required by the programmer (i.e. the data can be used without further processing), (b) more than one keystroke per variable is handled automatically, and (c) more

than one variable per input operation can be handled automatically. One drawback to this method is that typing a non-numeric key when numeric input has been specified (e.g. by an INPUT X statement) will result in termination of the program with an error message, unless a TRAP statement is used.

EXAMPLE

```
100 TRAP 150
110 PRINT "TYPE PRINCIPLE,INTEREST
(COMMA BETWEEN)"
120 PRINT "THEN PUSH RETURN."
130 INPUT PRIN,INT
140 GOTO 170
150 PRINT "NON-NUMERIC INPUT TRY
AGAIN"
160 GOTO 110
170 ...Continue with program.
```

2. GET statement. With this method, the screen must be OPENed first (see example). The GET statement will cause the program to stop and wait for input, but without displaying the question mark prompt or the cursor. The keyboard will "chirp" with each keystroke, but the key symbol will not be displayed. If the prompt, cursor or key symbol display are wanted, they can be programmed as desired.

Program operation continues as soon as any key is pressed; use of the RETURN key is not required. Only one character is input per GET statement. Data is returned in ATASCII code, which can be easily interpreted (see example). The following example has two sections. The first section, lines 490-560, (a) illustrates alphabetic input and (b) prints all input, right or wrong, to the screen. The second section, lines 570 to 630, (a) accepts either numeric or alphabetic input, and (b) prints only appropriate input to the screen. Line 490, the OPEN statement, prepares the computer for bypassing the normal BASIC keyboard routines.

EXAMPLE:

```
490 OPEN #4,4,0,"K:"
500 PRINT "TYPE S (STOP) OR C (CONTINUE)"
510 GET #4,X:REM-INPUTS NEXT
KEYSTROKE AS X
520 PRINT CHR$(X):REM-PRINTS KEY
```

continued

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SYMBOL TO SCREEN

```

530 IF X=ASC("S") THEN END
540 IF X=ASC("C") THEN 570
550 PRINT "TYPE S OR C - TRY AGAIN"
560 GOTO 500
570 PRINT "TYPE MENU CHOICE 1-4,M FOR
MENU"
580 GET #4,X
590 IF X=ASC("M") THEN PRINT "M";GOTO
1000;REM-THIS SECTION WOULD PRINT
MENU
600 X=X-48;REM-CONVERTS ATASCII TO
NUMBER
610 IF X<1 OR X>4 THEN PRINT "TYPE 1-4
OR M - TRY AGAIN";GOTO 570
620 PRINT X;REM-ONLY PRINTS TO SCREEN
IF INPUT IS CORRECT
630 REM-ROUTE PROGRAM ACCORDING TO
MENU CHOICE

```

3. PEEK(764) method. By using the PEEK(764) method, the programmer can bypass all BASIC and operating system processing to tailor the most appropriate response. The PEEK at memory location 764 does not halt program operation; the contents of this location are simply transferred to the specified variable and operation continues. RETURN is not used. The cursor, the "chirp" and the print to screen, if desired, must be programmed, but conversely, inappropriate keystrokes can be "masked out" or "disabled" by not programming responses to them. Alternatively, error messages can be printed for them.

In using this input method, a variable must be designated to receive the value stored in location 764. The value is transferred to, say, the variable X by the BASIC statement `X=PEEK(764)`. Simple enough, but there are two problems that must be dealt with by the programmer.

The first problem is that location 764 is not reset after use by the Operating System. The contents of location 764 are simply the numerical code for the last key pressed. There are many cases where an unforeseen keystroke can cause problems. For example, in executing a BASIC program, the last keystroke before execution begins is the RETURN to enter RUN. An early PEEK(764) would return the number 12, the code for

RETURN. The solution for this problem is to POKE 764 with the CLEAR key code, 255, before the first PEEK and after every PEEK. See the second example below.

The second problem is that the code used is neither ATASCII nor the internal code used for screen printing, but a third code which is called the "keyboard code". This code is nowhere near as neat or rational as the other two. Numbers, letters and special symbols are out of order and interspersed. How then is this code to be interpreted?

There are two solutions. First you can crack the code yourself by running the first example program below and typing the keys you want the code for. The program will print the key symbol and the code. Running this program will also give you a good feel for the way the PEEK(764) method works. In your program, then, check for the keys you want to respond to by using IF statements to compare the variable to the codes, one by one. This is the best method to use if (a) you are only responding to a few keys, or if (b) you do not want to print the key symbol. This method is used twice, once for each reason, in the second example program below.

The second solution is to use the ROM table that converts from keyboard code to ATASCII. The table starts at location 65278 (hexadecimal \$FEFE). If the Keyboard Code is X, then the ATASCII code is stored at location `65278+X`. The use of this table is illustrated in the first example program below. Two warnings though:

A. The table location is not guaranteed to be the same in future versions of the Operating System. Presumably there is a "safe" vector somewhere that points to the table, but Atari hasn't told us (or at least me) where it is yet.

B. Lower case codes are returned if SHIFT is not pressed at the time. This is a somewhat different convention than that used by BASIC, so be careful. The first example program below shows how to convert the lower case ATASCII code to upper case by subtracting 32 from codes in the range for letters.


EXAMPLE 1 (illustrates the various codes):

continued

```

100 GRAPHICS 0
110 PRINT:PRINT"TYPE AWAY!":PRINT
120 POKE 764255:REM-CLEAR AWAY OLD
CODES THAT COULD BE EMBARRASSING
130 PRINT "KBRD","KEY","ATSC"
140 PRINT "CODE""SMBL""CODE"
150 X=PEEK(764):REM-GET KEY CODE
160 IF X=255 THEN 150:REM-WAIT FOR
FIRST KEY TO BE PRESSED
    SO HEADINGS CAN BE READ          170
Y=PEEK(65278+X):REM-CONVERT TO
ATASCII
180 IF Y>96 AND Y<123 THEN Y=Y-32:REM-
CONVERT LOWER CASE TO UPPER
190 PRINT X,CHR$(Y),Y
200 GOTO 150

```

The second example illustrates (a) programming a loop that waits until a key is pressed allowing time for reading instructions (lines 200 and 210), and (b) program operation continuing without being halted by input operations. 

EXAMPLE 2:

```

100 GRAPHICS 0
110 PRINT "COUNTING PROGRAM":PRINT
120 PRINT "KEYBOARD CONTROLS"
130 PRINT "1 - PRINT EACH NUMBER
(DEFAULT)"
140 PRINT "2 - NO PRINTING"
150 PRINT "3 - PRINT 10'S ONLY"

```

```

160 PRINT "4 - RESET TO ZERO"
170 POKE 764,255:REM-CLEAR OLD KEY
CODES
180 PRINT "PRESS ANY KEY TO START"
190 Z=1:REM-SET CONTROL TO DEFAULT
200 Y=PEEK(764):REM-CHECK IF KEY
PRESSED
210 IF Y=255 THEN 200:REM-IF CODE 255,
NOT READY
220 POKE 764,255:REM-KEY PRESSED,
CLEAR CODE
230 X=0:REM-THIS IS COUNTING VARIABLE
240 Y=PEEK(764):REM-CHECK FOR NEW
COMMAND
250 IF Y<>31 AND Y<>30 AND Y<>26 AND Y<>
24 THEN 340:REM-CHECK FOR KEYS 1-4
260 SOUND 0501010:REM-START CHIRP
270 IF Y=31 THEN Z=1:REM-DECODING
280 IF Y=30 THEN Z=2:REM- COMMAND
290 IF Y=26 THEN Z=3:REM- CODE
300 IF Y=24 THEN Z=4:REM-KEY BY KEY
310 PRINT "CONTROL ";Z:REM PRINT TO
SCREEN RESPONSE
320 SOUND 0,0,0,0:REM-END CHIRP
RESPONSE
330 POKE 764,255:CLEAR KEY CODE
340 X=X+1
350 IF Z=2 THEN 240
360 IF Z=4 THEN Z=1:X=0
370 IF Z=1 THEN PRINT X:GOTO 240
380 Y=X/10
390 IF Y=INT(Y) THEN PRINT X
400 GOTO 240

```

SHORT BUT USEFUL

```

10 REM LIST.ENT
20 REM BY PAUL WHEELER
30 REM
40 REM SAVE THIS PROGRAM AS D:LIST.ENT
50 REM TO LOAD,LIST,DELETE,ENTER AND
60 REM SAVE A PROGRAM TO CONSERVE ON
70 REM MEMORY, AND HELP PREVENT SLIP-
80 REM UPS IN THE PROCESS.
90 REM USEFUL FOR ELIMINATING NO
100 REM LONGER NEEDED VARIABLES THUS
110 REM SHRINKING PROGRAM SIZE
120 REM
130 PRINT CHR$(125):DIM DN$(15):PRINT
140 PRINT:PRINT "ENTER '0' TO RETURN TO
DOS:"
150 PRINT "ENTER '1' TO END:":PRINT
160 PRINT:PRINT "DISK FILE NAME:
";INPUT DN$:PRINT CHR$(125)

```

```

170 IF DN$="1" THEN END
180 IF DN$="0" THEN DOS
190 PRINT
200 PRINT "LOAD ";CHR$(34);DN$;CHR$(34)
210 PRINT:PRINT:PRINT "LIST
";CHR$(34);DN$;CHR$(34)
220 PRINT:PRINT:PRINT:PRINT "NEW"
230 PRINT:PRINT:PRINT:PRINT "ENTER
";CHR$(34);DN$;CHR$(34)
240 PRINT:PRINT:PRINT:PRINT "SAVE
";CHR$(34);DN$;CHR$(34)
250 PRINT:PRINT:PRINT:PRINT "RUN
";CHR$(34);"D:LIST.ENT";CHR$(34)
260 REM
270 REM POSITION CURSOR TOP OF SCREEN
280 REM
290 POKE 84,0
300 END
310 PRINT:PRINT "PRESS [RETURN] AFTER
COMPLETION"
320 PRINT "OF EACH COMMAND."

```


DOWN MEMORY LANE

By Sheldon Leemon

Remember way back to my last column when I introduced a byte-transfer routine as a method of saving your screen to disk? I mentioned then that the routine could be used for a number of other applications. Well, I thought I might get more specific on some other uses. Before I start, a couple of comments. First, I would like to apologize for the bug in the listing in the screen read routine. As Ron Kramer astutely pointed out, line 2010 had a statement that read PUT I,A. This is not a legal BASIC statement, and should have read POKE I,A. I could just admit I goofed, but I would rather just say that it was my idea of a swell April fool's joke. Pretty funny, eh? The correct listing is included below. Next, I would like to point out that the routine will work with cassette as well; although cassette I/O is inherently slower, this routine works relatively quickly. All you have to do is replace the statement "OPEN #X,Y,0,"D:DISKFILE" with the statement "OPEN #X,Y,128,"C:". The auxiliary value of 128 means that the cassette will use short interrecord gaps. If that sounds like Greek, how about saying it goes faster?

One very helpful application is in developing character screen displays, both of plain text, and redefined graphics characters. This will let you do things as diverse as setting up a nice screen of instructional text (without having to figure out the spacing using multiple PRINT statements) to designing game boards. The following program shows how to do this:

```
10 OPEN #2,4,0,"K:"
20 GET #2,A: IF A=27 THEN POKE
752,1:?CHR$(28)::GOSUB 1000: POKE 752,0:
?CHR$(28)::END
30 ?CHR$(A)::GOTO 20
1000 OPEN #1,8,0,"D:SCREEN.DAT"
1010 PUT #1,PEEK(939): FOR I=0
TO 3: PUT #1,PEEK(708+I): NEXT I
```

```
1020 RAMTOP=PEEK(106)*256: DL=
PEEK(560) + PEEK(561): BYTES=
RAMTOP-DL: HI=INT(BYTES/256):
LO=BYTES-(HI*256)
```

```
1030 POKE 850,11:POKE 852,PEEK(560):
POKE 853,PEEK(561): POKE 856,LO:
POKE 857, HI
```

```
1040 X=USR(ADR("hhh*LVd"),16):
CLOSE #1: REM The * and d must
be inverse video
```

To use this program, just type on the screen until you get the image just as you want it. Then, hit the ESCape key to save the screen to disk. To read it back in, use the routine given last month:

```
2000 OPEN #1,4,0,"D:SCREEN.DAT"
2010 GET #1,A: GRAPHICS A: FOR I=
708 TO 712:GET #1,A:POKE I,A:NEXT I
2020 POKE 850,7:POKE 852,PEEK(560):
POKE 853,PEEK(561):POKE 856,255:
POKE 857,255
2030 X=USR(ADR("hh*LVd"),16):
CLOSE #1: REMember to invert * & d
```

Later, if you want to put the screen data into PRINT statements, so that no I/O read will be necessary, you can let the computer do the work, by OPENing the screen data file for a read, and GETting the data bytes 40 at a time to put into PRINT statments (the technique of making your computer write lines of program code for you has been discussed elsewhere, and it's not too hard to figure out how to make a program loop print line numbers, PRINT statements, and then data read in from a disk or tape). If you do try to put this data into PRINT statements, remember to convert from Internal Character Set order to ATASCII.

Another nice use for this kind of a routine is to install a redefined character set into a BASIC program. Although I hinted at this in my application notes in the Instedit manual, I never actually came out and gave the routine. Well, here is all you need to read in character data from a file called MY.SET:

```
1000 RT=PEEK(106)-5: POKE 106,RT:
```

continued

GRAPHICS 0: BASE=RT+1

1010 OPEN #1,4,0, "D:MY.SET"

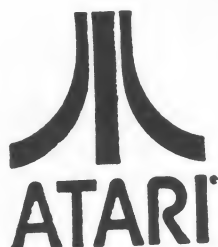
1020 POKE 850,7:POKE 852,0:
POKE 853,BASE:POKE 856,0:POKE 857,4

1030 X=USR(ADR("hhh*LVd),16):
CLOSE #1: POKE 756, BASE: RETURN:
REMEMber to invert * & d

Another good use for this technique is to save long strings. Just use the ADR function to find the starting address of the string, and then split this address into two bytes with the formula $HI=INT(AD/256):LO=AD-(HI*256)$. Store the low byte in ICBAL and the high byte in ICBAH. Then, split the LENGTH of the string into high and low bytes, and store them in ICBLH and ICBLI respectively. Set the command number in ICCOM, then use the CIO calling routine in the USR statement above.

I hope that these techniques will spur you to experimenting more with character graphics, (and, not accidentally, into buying more copies of Instedit, the handy home wonder for creating characters). These routines represent some of my pet programming techniques. What about yours? I've been writing this column for months, and besides the odd muttered compliment, I've gotten no feedback whatsoever. I mean, its like one of those Twilight Zone episodes, where this guy wakes up and finds that everybody else has disappeared, and he keeps running around looking for them, and it turns out that either he slept for 1000 years, or there was a nuclear war, and nobody told him, or something. Do Do Do Do, Do Do Do Do, Do Do Do Do, Da-Da-Da DAH. So how about it gang? I'm getting tired of both asking the questions and giving the answers--its like playing piano duets by myself. Let's change the format to Ask Dr. Memory, with some active reader participation. I'm tap dancing as fast as I can, but I can't keep it up forever.

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SPEEDING UP ATARI BASIC

By Jerry White

For those of you that only know Jerry White as an outfielder for the Montreal Expos, let me introduce myself. I don't play baseball. I make my living from my ATARI software and by writing for various magazines.

I recently read the March and April issues of your Newsletter and was very impressed. I find it hard to believe that a nonprofit organization can put out such a quality publication on a monthly basis.

While reading Eric Sobocinski's article on page 22 of the April issue, I thought of a few ways to speed up his BASIC code. Don't get me wrong. I know that his code was written to demonstrate modifications to ATARI's character set. I found the article and program to be very informative and well written.

I modified his code to demonstrate methods of speeding up ATARI BASIC. If you look at page 22 of the April 1982 newsletter, you will find two programs. I've combined them, removed all REM statements, rearranged the instructions, and added few.

Look at my version of this program. In line 10, I've added the GRAPHICS 0 command and POKES to location 559 to disable and enable the screen display. The combination of the POKES, the elimination of REMs, and keeping the FOR/NEXT loop on a single line, cut down the character set move from 15 seconds to about 9.

The slowest part of the program is the large character display routine. We could speed that up by about 1/3 if we disabled the screen again, but at least for the time being, don't add those POKES.

Notice that I jumped from line 10 to line 200. I did this to get the large character display routine as close to the beginning of the program as possible. FOR/NEXT loops execute faster if they are kept near the beginning of a program. In this case, the program is so small that it won't make much difference. For a better example, load a

rather large ATARI BASIC program. Add this line as line 0 and again as line 30000.

```
0 GRAPHICS 0:POKE 559,0:FOR X=1 TO 1000:NEXT X:POKE 559,34:STOP
```

You will find the loop at line 0 to be many times faster than the exact same code at line 30000, if a large program is placed in between.

When trying to make an ATARI BASIC program faster, try to eliminate as many mathematical calculations as possible. The original program had one unnecessary exponential calculation in line 90. Looking at my version, I added the variable P2 to hold the value of 2^B in line 50. Then I used P2 instead of 2^B and avoided one calculation. You will notice the difference if you watch the original program when it puts each CHR\$(160) or cursor on the screen.

Other than restructuring the code, the only other change I made was to add a TRAP in line 210, just in case the user enters non-numeric input or presses the RETURN key before entering a number.

Since most of my software is written in ATARI BASIC with Assembler subroutines, I've learned lots of little tricks that make programs run faster and look more professional. Hopefully this little demonstration will help you use ATARI BASIC more efficiently, and I'll be able to show you other ways in future articles. ☺

```
10 GRAPHICS 0:POKE 559,0:FOR L=0 TO 1023:POKE L+14336,PEEK(L+57344):NEXT L:POKE 756,56:POKE 559,34:GOTO 200
50 FOR L=C TO C+7:?" L;" "":P=PEEK(L):FOR B=7 TO 0 STEP -1:P2=2^B:IF P<P2 THEN ? CHR$(32):GOTO 100
90 ? CHR$(160):P=P-P2
100 NEXT B:?"NEXT L:GOTO 210
200 ? CHR$(125):?"TYPE A NEGATIVE CODE TO STOP"
210 POKE 84,3:?"INTERNAL CODE":CHR$(254):CHR$(254):TRAP 210:INPUT C:IF C<0 THEN END
220 C=C*8+PEEK(756)*256:FOR L=1 TO 5:?"NEXT L:?"LOCATION":GOTO 50
```


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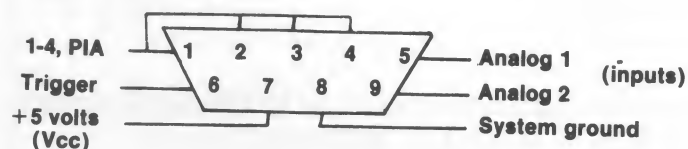
INTERFACING YOUR ATARI

By Marshall S. Dubin

Part 2: Controlling Power

Last month we looked at various ways of monitoring "real world" devices such as thermostats or light sensors using Atari's joystick ports. This month, we will look at ways to use the ports for output. This gives you a means to control a wide variety of external devices, relays, and the like.

As you can see from the pin diagram in the figure, the joystick port has several potential input sources available. For example, two of the pins are intended for use with the paddle controllers. These are called the ANALOG pins. They take an analog source such as a variable resistance and convert it into a digital signal. This is in essence how the paddles function. They provide a resistance via a potentiometer within the paddle unit, between the analog input pins and +5 volts DC. The computer interprets the variable voltage as a digital number between 0 and 228. This is called "on board" analog to digital conversion. Units performing a similar function may be purchased at a hefty price, but Atari owners have the use of 8 of these units built right in!



For now, let's concentrate on pins 1-4 on the joystick ports. These are the pins of the Peripheral Interface Adapter chip, more commonly referred to as the PIA. Basically the PIA provides a means of connecting your computer to peripherals. The PIA chip can be programmed for either input or output. There are two PIA ports of eight bits each available for your use. Joystick ports 1 and 2 compose PIA port A, while joystick ports 3 and 4 compose PIA port B. Each port is one byte (8 bits) and may be used together or individually to provide input and output functions. Some of these functions may be used to drive a printer or other accessory, or even a series of power relays which can control alarms, lights, appliances, motors or whatever.

The problem involved in controlling larger interface devices is basically a problem of taking a small amount of power and amplifying it. The ports on your computer are not made to power anything more than another chip. The manual recommends a maximum of 1 TTL load (1.6 ma.) for each PIA bit, and no more than 50 ma. at the +5V pin. If we are using relays or controlling power, we will need at least 12-24 volts.

There are several ways to accomplish this task. The figures below illustrate some of them. The most common arrangement is the transistor driver. In this arrangement the computer provides a very small voltage which turns on the transistors which in turn switch the load. A second way is through the use of opto-isolators. The computer provides 5 volts which switches the LED (light emitting diode) of the isolator on. When the diode is lit, this triggers a photo sensitive transistor which is connected to a larger load or a relay. A DARLINGTON transistor package can be used in a similar fashion. The low voltage fires the Darlington transistor which can then switch a considerably larger current. Finally there are integrated circuit interface chips such as the 7407 which allows a switching of up to 30 volts from the 5 volt TTL level of the Atari.

All of these methods will work, and actually which one to use will depend on the specific environment or task lined up for them. The method I prefer is the 7407 chip. It is inexpensive, will handle up to 30 volts, and has six gates, so that I may switch six devices from a single chip, and will handle about 30 ma which will drive most small relays or solid state switches.

The SN7407 made by Texas Instruments is an open collector device. To use it properly you must connect a 2.2K ohm resistor from each output to +5 volts. When an output is "on" the output is actually open - so the resistor supplies +5 to the device you are driving. You can drive up to 30 volts at the outputs (but you may have to tamper with the value of the resistor somewhat). When an output is "off", it is shorted to ground, and your device sees 0 volts (ground actually). The resistor limits this current to a fairly low value so you don't blow the power supply or worse, the chip! Since the resistor can't supply much current, make sure the resistor/7407 combination is seen as the

continued

"ground side" of your circuit, i.e. to drive a relay, connect +5 to one side of the relay, and the other side to the output of the 7407. Then, to turn the relay on, turn the 7407 OFF. Current will flow through the relay, and then through the 7407 to ground.

You can easily drive discrete LED's with this too (such as for test lights), as well as a variety of small relays or solid state switches. Just make sure you SINK the current ie. one end of your driven device goes to +5 (through a resistor!) and the other end to the 7407. Sending a "0" (logic level low) to the PIA turns the device ON, and a "1" (logic level high) turns it OFF. If you want to do it the other way around, use the inverting 7406, which will turn your device ON with a high logic level and OFF with a low level. Recognize though that the default state of the PIA when the computer is powered up is all bits high. If you are using an inverting 7406, your devices would come alive when you powered on the Atari. This is why I prefer to use the 7407, since I can power up and then have my software drive the devices by writing a 0 to the bit I want to power a device from.

Speaking of bits, a few words are in order about the structure of the ports before you run off to warm up your soldering irons. The PIA as I mentioned earlier consists of two ports, port A and port B (or PORTA and PORTB for all you pneumonics phreaks). These are controlled through the use of the control registers for each port, PACTL and PBCTL. You may have heard of the PACTL because that's the one you poke with 52 to turn on the cassette player. The addresses are as follows:

PORTA 54016/\$D300 - port A address

PORTB 54017/\$D301 - port B address

PACTL 54018/\$D302 - port A control

PBCTL 54019/\$D303 - port B control

On power up, the ports are initialized to \$FFFF or all bits high. To use a port for input, just pull the bit of your choice low by connecting it to ground. To use the port for output, it first must be formatted for output. The procedure is not complex:

1. Poke the control register (PACTL or PBCTL) with 56/\$38 hex.

2. Now poke the port (PORTA or PORTB) with 255/\$FF hex. This specifies the port will be used for output.

3. Poke PACTL or PBCTL with 60/\$3C hex.

4. Now just poke the port (PORTA or PORTB) with your data.

Essentially you have a total of 16 bits to play with. Just remember that two joystick ports make up one PIA port. Stick 0 and 1 are the A side and stick 2 and 3 are side B. Each joystick port is 4 bits or 1 nybble. Each side of the PIA is 8 bits or 1 byte. When programming for output, you must remember that a specific BIT is driving a device. Therefore one joystick port can drive 4 devices (1 for each bit). An entire PIA side will handle 8 devices and if you use both A and B sides you can trigger 16 individual devices at once or in any combination. You must POKE into that port a decimal number whose BINARY representation will switch on a certain bit or series of bits. For example, if I POKED a 255 into port A, all bits would be on. If I POKED a 12 into port A, bits 3 and 4 only would be on. The individual joystick ports may be read using the shadow registers as follows:

Jack 1 (STICK 0) 632/\$278 hex

Jack 2 (STICK 1) 633/\$279 hex

Jack 3 (STICK 2) 634/\$27A hex

Jack 4 (STICK 3) 635/\$27B hex

You also can use the BASIC keywords STICK to access these ports eg, X=STICK(0), etc.

The program listing will provide you with a demonstration on how the ports are programmed. The program first allows you to select a port, and program it for either input or output. Then you can write data to the port and the computer will peek the port and verify the data you wrote. Granted this isn't elaborate, but it works. Next time we will delve into a useful construction project, and I'll provide a more sophisticated driver routine to monitor real world data. For now, get used to the functions of the PIA ports and the various drivers I have illustrated. Then prepare your soldering iron for action, and I'll see you next month! ☺

continued


```

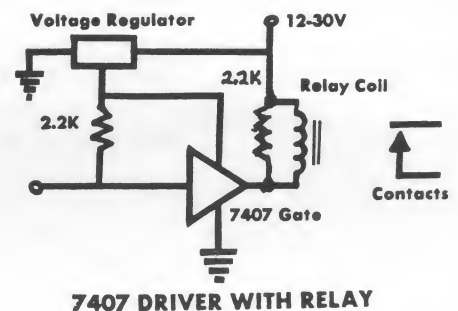
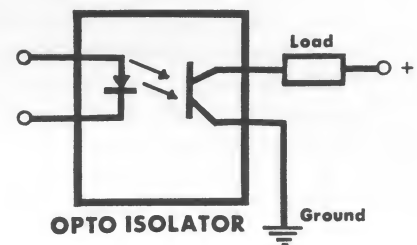
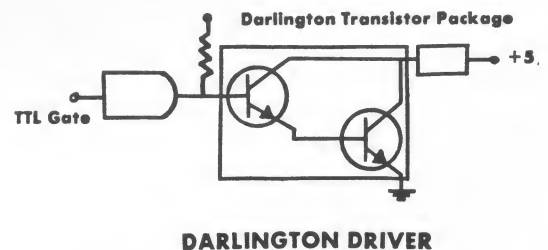
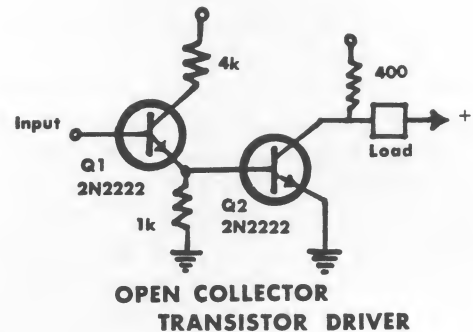
10 REM * PROGRAM TO FORMAT PIA PORTS
20 REM
30 GRAPHICS 0:POSITION 10,2
40 DIM IO$(10),DATA$(3)
50 PRINT "PIA PORT DEMO"
60 REM
70 REM PORT ADDRESS
80 REM
90 PORTA=54016:PORTB=54017
100 REM
110 REM * ROUTINE TO CONFIGURE PORT
120 REM
130 TRAP 130:PRINT :PRINT "Configure which
port (1-4) ";
140 INPUT PORT:IF PORT<1 OR PORT>4
THEN 130
150 REM
160 REM SELECT PORT CONTROL REGISTER
170 REM ADDRESS (PACTL,PBCTL)
180 REM
1 9 0   I F   P O R T < 3   T H E N
PCTL=54018:PORT=PORTA
2 0 0   I F   P O R T > 2   T H E N
PCTL=54019:PORT=PORTB
210 PRINT :PRINT
220 REM
230 REM SELECT INPUT OR OUTPUT
240 REM
250 PRINT "Input or Output ";
260 TRAP 250:INPUT IO$
270 IF IO$(1,1)="I" THEN F=0:GOTO 340
280 IF IO$(1,1)="O" THEN F=255:GOTO 340
290 GOTO 250
300 PRINT
310 REM
320 REM CONFIGURE THE PORT
330 REM
340 POKE PCTL,56
350 POKE PORT,F
360 POKE PCTL,60
370 PRINT :PRINT
380 REM
390 REM ENTER YOUR DATA
400 REM
410 IF IO$(1,1)="I" THEN PRINT "PORT IS
FORMATTED FOR INPUT":PRINT :GOTO 130
420 PRINT "NOW ENTER YOUR DATA"
430 PRINT "(ENTER A RETURN TO DO
ANOTHER PORT)"
440 INPUT DATA$:IF DATA$="" THEN PRINT
CHR$(125):GOTO 130
450 TRAP 530
460 REM
470 REM POKE DATA TO PORT/VERIFY IT
480 REM
490 POKE PORT,VAL(DATA$)
500 PRINT "VERIFY ";PEEK(PORT)
510 GOTO 440

```

```

520 END
530 TRAP 40000:PRINT "INPUT ERROR,
RE-ENTER ";GOTO 440

```



THE GREAT ATARI MYSTERIES

By Eric Sobocinski

Part 2: Double Trouble

Hi there! Welcome to another trip through Atariland. Perhaps some of you are wondering why I changed the name of this column after just one month. I decided that I want to write about more than just memory. There are a lot of other areas that still need to be covered. Incidentally, if anyone feels they can give us suggestions, or even better, write their own little article, please do so.

A BIT OF BINARY

Here's the squib I promised you last month. In normal life we use the decimal system (base 10). There are ten digits, and each place has a value that is ten times that of the place to its right. The binary system, in comparison, is base 2. There are two digits, "0" and "1", and each place has twice the value of the place to its right. The value of each binary place is given below:

Place:	7	6	5	4	3	2	1	0
Value:	128	64	32	16	8	4	2	1
Notice:	$2^7=128$	$2^6=64$	$2^5=32$	$2^4=16$	$2^3=8$	$2^2=4$	$2^1=2$	$2^0=1$

If we wish to find the decimal number 673, we reason that there are 6 hundreds, 7 tens, and 3 ones:

$$6 \times 10^2 + 7 \times 10^1 + 3 \times 10^0$$

The same thing is done with binary. Let's use the decimal number 37. 37 is not 64 or greater, so we ignore place values higher than 32. There is one 32 in 37, so we write a "1" and subtract: $37-32=5$. There are no 16's or 8's in 5, so we just write two "0". There is a 4 in 5, so we write a "1". $1-1=0$, so we just fill in the rest of the places with zeros, except there aren't any more places. Now that we're done, you should have 100101. When we deal with computers, though, we usually deal in eight

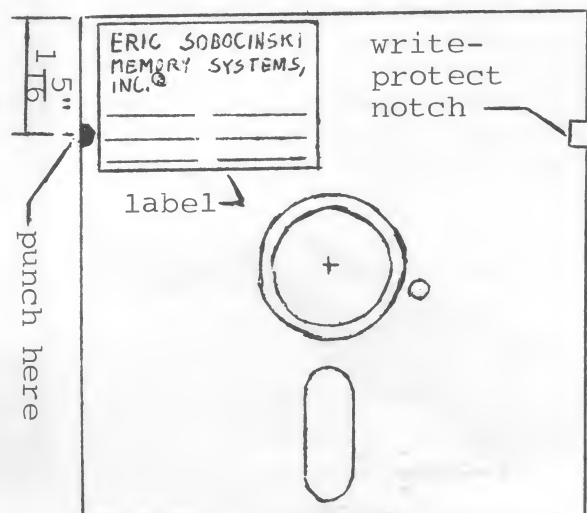
digits, or a multiple of eight, so our final result is 00100101.

Going from binary to decimal is much easier. In the example above there are "1's" in the 32's, 4's, and 1's places (place numbers 5, 2 and 0). Add them together: $1 \times 32 + 1 \times 4 + 1 \times 1 = 37$. That's all there is to it. Hexadecimal is base 16. Letters A through F symbolize the numbers 10 through 15. See if you can figure it out yourself.

FLIPPING YOUR DISK

Most of you have probably heard about using both sides of a standard diskette, but don't know how. It's really simple. Using a common paper hole punch, carefully cut a half circle directly opposite the write-protect notch, as shown below. On a 5 1/4 inch diskette, center your punch exactly 1 5/16 inches from the end of the diskette. Make sure the measurement is fairly accurate. When directions are followed, there should be no problems. At least I haven't heard of any. A few words of warning! Many of the companies who make your diskettes will not honor their warranties once you have altered them, so make sure side one works before you try this procedure. Also, normal disk care becomes doubly important when you double-side a disk. Always keep your disks clean and never touch the disk itself.

Here I am, my mind devoid of anything else to say for this month. This is May, isn't it? Happy Birthday M.A.C.E.! In closing, I would like to welcome any comments you have about anything Atari, or even this series. Good luck and Happy Computing! ☺



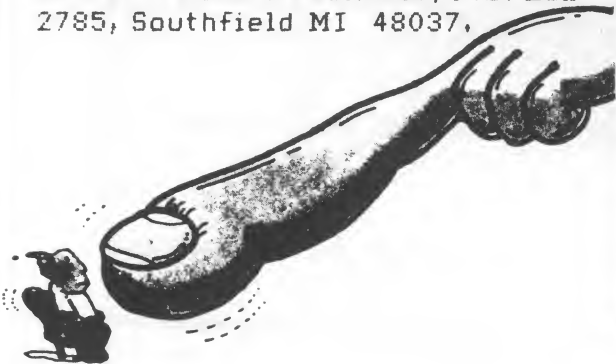
MACE WANTS YOU!

MACE is a non-profit organization which is run on a voluntary basis BY MEMBERS, FOR MEMBERS. This newsletter is not meant to be a forum for the few in the know to lecture the rest of us on what we should be doing with our computer. Rather, it is a place for members to share with others the experiences they have had relating to the field of personal computing. The range of things we would like to deal with in this newsletter is as wide as the range of experiences of our members.

So, don't think that just because you don't have a doctorate in computer science that you have nothing to add. We are interested in receiving articles from members at ALL levels of experience--a majority of our readers could probably be classified as beginners, and they could really benefit from the experience of other beginners, or those who can remember when they were beginners and speak to the subjects that confuse and puzzle those just getting started.

And, of course, we are not just interested in technical articles. Everybody has bought some kind of software. Maybe you would like to let others know which software you liked, and why, or which to avoid. Even personal experiences on how computers have changed your lifestyle, your family life, your circle of friends could be written up. You could become the Erma Bombeck of MACE.

MACE has tried its best to give as much as possible to its members. But that's only possible if you give something back. Write an article, and send it to MACE Newsletter, P.O. Box 2785, Southfield MI 48037.



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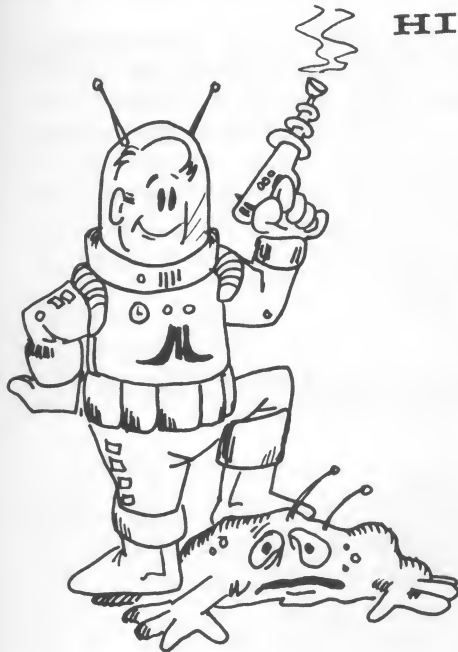
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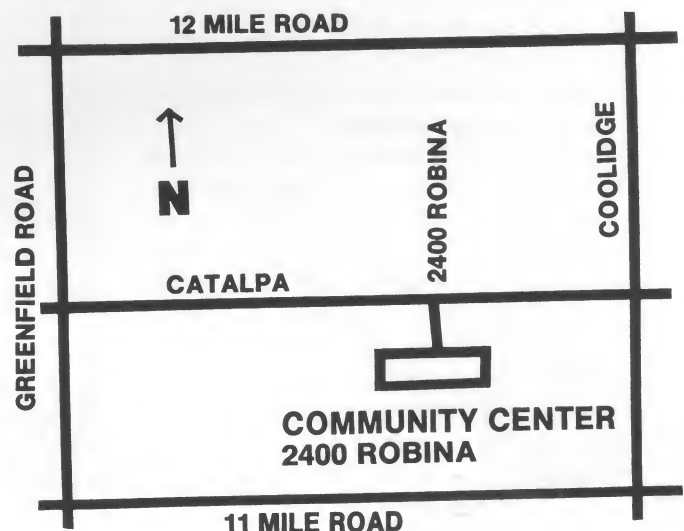
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JULY 15	OCT. 21
AUG. 19	NOV. 18

DECEMBER 16

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SOME GOODIES FROM THE BBS...

MSG# 0318 DATE:04/20/82 TIME:01:31:20
FROM: WILLIAM VOLK

TO: ALL

SUBJ: FORTH-GRAPHICS

I have developed a turtle graphics package for atari forth. This includes all the Pilot/Logo commands and trig functions (interger), viewports and clipping. When compiled it occupies only 1.5K of Ram. I am also working on a players-missile package, which allows animation, and double players. I will probably have a link to Dos files working soon.

William Volk, Box 2053 Babcock, Durham Nh.

~MSG# 0322 DATE:04/20/82 TIME:23:57:35

FROM: Curt Deegan

TO: ALL

SUBJ: Michigan INFO-fone

An established Bulletin Board with over 11,500 callers and the kind of quality msgs this volume of use creates, is now waiting for your call. INFO-fone(tm) is located in Southfield, MI, and can be reached 24hrs a day at: (313) 357-1422. Call today for IBM-PC, APPLE, and other popular systems info. There are also more extensive information files and even downloadable programs. The -fone has two comprehensive phone lists of other bulletin board systems all over the country, arranged by both name as well as by area code. You should make a -fone call today, and regularly, to keep up on the latest. - Curt (SYSOP)

MSG# 0330 DATE:04/22/82 TIME:09:56:31

FROM: Sheldon Leemon

TO: KA6ETB, KA8MBJ, and all Hams

SUBJ: Atari Amateur Radio Net

I have just spoken to Jack McKirgan II, WD8BNG in OH, who is pleased to announce that the Atari Users' Net is full speed ahead. The first on-the-air meeting will be on May 2 at 1:00 UTC (Saturday night, civilian time) on 21.410 MHz. Because coverage is bound to be more or less transcontinental on 15, a more regional version will meet on Sunday afternoons, 18:00 UTC on 7.235. A West

Coast version of the 40 meter net is being worked out now, and there should be some word on it soon. Jack really intends to do this up big, with a newsletter and everything. So all you hams, take note. Don't be a no-show, or recurrent lock-up may result! Those who wish an eyeball with Jack and other Atari Hams at Dayton should listen on 144.055. 73 de N8SL.

MSG# 0360 DATE:04/28/82 TIME:21:43:58

FROM: Ollie

TO: ALL

SUBJ: Atascii Mode

Many of the callers to this BBS have stated that they cannot enter Atascii mode with the 'A' command. When the BBS prompts HIT <RETURN> after entering 'A', you must respond with an ASCII 155 character. If you have Telelink 1, or another ASCII type terminal that 'returns' an ASCII 13 for the return character, you cannot enter Atascii mode. Leave a comment when you log-off if you have additional questions.

-- Ollie

MSG# 0277 DATE:04/11/82 TIME:00:31:24

FROM: JIM STEINBRECHER

TO: ALL

SUBJ: SETAUTO PROGRAM

There is a new program on download called SETAUTO. This will allow you to auto boot to a basic program on the disk. You may want to use it with the MENU program as in the example. Now the novice and the not so frequent user can get a disk program going. SETAUTO also will work with the Assembler/Editor if a valid Editor command is used! ☺



BASICALLY SPEAKING

By Judy Braun

Using The INT Function

The INT function is a method of eliminating the decimal portion of a number. For example, if $X=3.887$ then the $INT(X)$ will equal 3. Notice that the INT function alone does not round off. So what can we do with it?

One application is to express a division problem in the form of a quotient and its remainder. If you wish to divide 17 by 3 (3 17 or $17/3$) and express the answer as 5 with a remainder of 2 instead of 5.66666666, we can use the following routine:

```
10 N=17:D=3
20 Q=INT(N/D)
30 R=N-(Q*D)
40 PRINT Q;"R";R
```

In line 20, $17/3=5.66666666$ and its integer is 5. To find the remainder, we multiply $5*3$ and subtract it from 17 (line 30). Line 40 prints our solution.

Another application is to split numbers into separate digits. "25" is 2 tens and 5 ones. We will divide 25 by 10 and find the remainder. Using the above routine (changing line 10 to $10 N=25:D=10$), we divide 25 by 10 (2.5) and take the integer in line 20. Result: $Q=2$. In line 30, we multiply 2 by 10 and subtract the result from 25 resulting in $R=5$. Then in line 40 we can: `40 PRINT Q;"TENS AND ";R;"ONES"`. Now for some practice...

WRITE A PROGRAM THAT FINDS *ALL* 3 DIGIT NUMBERS SUCH THAT THE SUM OF THE CUBES OF ITS DIGITS EQUALS THE NUMBER ITSELF.

EXAMPLE:

$$153 \rightarrow 1^3 + 5^3 + 3^3 = 125 + 27 = 153$$

Thus 153 is one of the solutions.

Use the remainder routine. It is not necessary to PEEK or POKE or change the

character set...just plain and simple BASIC!!!
Send your written programs and solutions to me and next month we'll print the best solution and try another puzzle.

Looking forward to hearing from you.

Judy Braun
38281 Eliot
Mt. Clemens, Mi. 48043



WORD SEARCH PUZZLE

```
Y L R Y D N A H F V A U Y B Y Y Y L H G
M Y S A E U Q P N E X T R A H S D U C K
R A A L L S T A R Y F H G E R R Y R E Y
A E T S A P N N X H C T A P F Z E N Z R
E Q M Y U Z B G N A G R O B O N J L B P
R I P S O G E I F V A G Y N W M A A F E
A A F Q U A R T Z D X I A O T T B U Z T
B W S S I H Z B I X N J K T C C U G N Z
I L W T X E T U C T R A O U I H P I B E
N A D T I N S K I K L Z R X K I T T E N
B P G L G F M J J O K T U X D U F T A H
D H R Q I N S U D G S C L G F K L B S J
M O E Y X P K Z L B B E T S N P E Z P L
A C A T P D M F O O U U H O P O R K R E
E F T H T J O U P L C U W X W B U W I D
L B B N F A A F J D Y L L G J A T F N L
G R D O T J M J P K E D F A H L N O W I
S T B Q D I G E W D Z Z B F X Z E R V U
X F V D Q Y M K G P Y H D G P Q V N X B
S C C Q Y Q R E Q U I C K T E F X Z F D
```

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ASPRIN	HISS	PATCH
BARE	JAZZ	QUARTZ
BUILD	JUMP	QUEASY
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1. Your system: ☐ Atari 800 ☐ 400 ☐ DISK ☐ TAPE
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2. What is the primary use of your system?

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3. What kind of things would you LIKE to do with your system?

4. Do others in your family use the computer? yes no

5. If yes, what for?

6. What kinds of things do you like reading about in MACE?

7. What would you like to see more of?

8. Less of _____

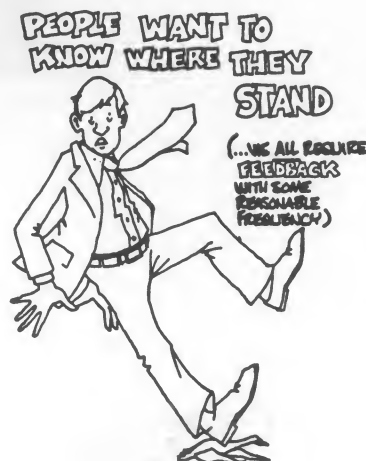
9. Suggestions: _____

10. Your age _____

11. Ages of other users in your family _____

Thank you for your time in filling this out. Please send you replys to:

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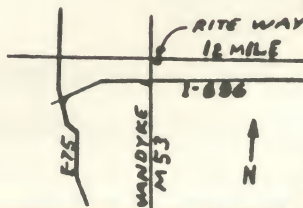
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